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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/084,320   | 02/28/2002  | Joe Cargnelli        | 9351-95             | 1996             |
| 1059   | 7590        | 03/28/2005           | EXAMINER            |                  |
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|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 3753                |                  |

DATE MAILED: 03/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/084,320

Applicant(s)

CARGNELLI ET AL. ED

Examiner

John K. Ford

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3753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on Jan 10, 2005
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 4, 5, 7-9, 11, 12 and 17-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4, 5, 7-9, 11, 12 and 17-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Applicant's response of January 10, 2005 has been given careful consideration.

112 First Paragraph

Applicant asserts that heat exchangers 118 and 118a are arranged "for heat to be removed from a common coolant". (January 10, 2005 response, page 2, lines 3-5). This appears to be inaccurate because the common coolant that applicant appears to be claiming is circulated through heat exchanger 134 not heat exchanger 118. There is no common coolant circulated through heat exchangers 118 and 118a even assuming (as applicant does) that the upper and lower portions of Figure 7 are identical.

Moreover on page 9, lines 6-12, it states that many of the elements of these two lines 90 and 92 are common. It clearly does not state that all the elements of the two lines 90 and 92 are common. It is very clear that much of the detail shown in the bottom half of Figure 7 is not identical to that shown in the top half, notwithstanding applicant's remarks to the contrary. These differences, coupled with the fact applicant explicitly states that not all the elements between the upper and lower parts of Figure 7 are identical, coupled with the fact that there is no supply conduit (144a?) shown at the bottom in Figure 7 render the currently claimed subject matter unsupported by the original disclosure. Indeed the valve (not legended) at the far left side of the lowest portion of Figure 7 appears to be controlled in a completely different way based on the lines connected to it at the valve actuator than a similar valve (148) at the top of Figure 7. Finally, even if two conduits (146a and 144a) were shown at the bottom of Figure 7, applicant has asserted (last full paragraph at the bottom of page 3 of the January 10, 2005 response) that it is "common practice" to use a central supply of coolant. Be that as it may, it is also common practice to use different sources of coolant in some equipment to facilitate different temperatures.

Therefore it cannot be stated with any reasonable assurance that applicant was in possession of the subject matter (namely the common coolant supply) claimed at the time of invention. There are too many ambiguities in Figure 7 and the description thereof for one of ordinary skill to assume that pipes 144 and 146 and unillustrated pipes 144a and 146a; if they even exist, were plumbed to a common source source of coolant. In fact applicants admit as much when they resort to the argument of “entirely common practice” at the bottom of page 3 of their response in lieu of pointing out any explicit disclosure to support this limitation. Finally, even if one were to assume everything that counsel has stated is true, there is no common coolant through heat exchangers 118 and 118a. These two heat exchangers clearly are associated with separate cooling loops.

35 USC 103

On page 4 of the January 10, 2004 response applicant correctly states the criteria for 35 U.S.C. 103 rejections.

Applicant concedes that JP 9-35737 shows separate humidifiers 2A and 2B for the fuel and oxidizer of a fuel cell, which is all that it was cited to teach. Applicant then asserts without supporting logic or reasoning that the humidification “would seem to be somewhat arbitrary” in this reference. The Examiner does not see any evidence to support this speculation. In fact it appears to be contrary to conventional knowledge in the fuel cell field as evidenced by Fleck (USP 5,432,020), which discloses (Abstract, second sentence) – “To ensure high efficiency, the process gas must be introduced at a predetermined temperature and humidity”. Fleck forms no part of the rejection and is relied upon purely to rebut applicant’s argument that the humidification in JP ‘737 is a somewhat arbitrary. If that were the case, it is submitted that the

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fuel cell would not operate in a highly efficient manner, which is contrary to the goals of fuel cell technology and the simple logic that fuel cell designers do not normally go about designing poorly performing fuel cells.

Applicant then asserts, again without supporting reasoning, that JP 5-256468 and Weitman are non-analogous art. Both JP '468 and Weitman are concerned with controlling the humidity and temperature of air to a specific degree. Since the oxidizer in fuel cells is typically air, the Examiner disagrees with applicant's conclusion that JP '468 and Weitman constitute non-analogous art. The problem of simultaneously controlling temperature and humidity in a gas and more specifically in air is a concern in both fuel cells (as evidenced by Fleck) and in other process controllers (JP '468 and Weitman). Moreover, applicant's unsubstantiated allegations that there is no need for accurate control of humidity and temperature in a semiconductor processing facility is not agreed with. Regarding the "abrupt change" argument, it is noted that none of the claims specify any particular response time to change. Thus, the argument is incommensurate with the scope of the claims. Moreover applicant's own disclosure measures response time in terms of minutes (not seconds) suggesting that his own device is fairly slow to respond.

Regarding the physical incorporation argument, applicant is correct to note that humidifiers 2A and 2B of JP '737 are compact, but as applicant has also noted there is no necessary degree of compactness specified in the claims, applicant's own system is very large and in a test station for fuel cells such as applicant has designed and disclosed here, there is no requirement for small size.

Regarding the fact that the abstract of JP '468 uses the terms "water-vapor generator" to describe element 24, it is submitted that this is the same thing as a steam source as evidenced by the more detailed translation of the entire document that was provided to applicant.

The following is a quotation of the first paragraph of 35 U.S.C 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 4, 5, 7-9, 11, 12, and 17-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no original disclosure to support the newly added limitation that the "first and second heat exchangers are arranged for heat to be removed there from by a common coolant supply". Figure 1 doesn't show this and Figure 7 doesn't show this. The bottom portion of Figure 7 is so lacking in detail at present that it doesn't even appear to be operative. Pipes (shown in the upper portion of Figure 7) are critically missing in large numbers as evidenced by comparing the upper and lower portions of Figure 7. It is however, beyond dispute that first heat exchanger 118 and second heat exchanger 118a are not arranged for heat to be removed from a common coolant supply. Heat exchanger 118a doesn't even appear to have a proper fluid connection to and from any coolant supply. Applicants remarks beginning on page 7 of the April 30, 2004 response address no comments to where the specification, original claims or drawing

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figures support these limitations and their latest response does not present a convincing case either.

The following is a quotation of 35 U.S.C 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 7 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teaching of JP 9-35737, JP 5-256468 and Weitman.

JP 9-35737 teaches two humidifiers 2A and 2B properly conditioning fuel gas and oxidizer before entering a fuel cell. In the case of cells it is known to have two humidifiers, one for the oxidizing gas (i.e. 2A of JP 9-35737) and one for the fuel gas, (i.e. 2B of JP 35737). To have used two of the systems for delivering precise humidity and temperature to condition fuel gas and oxidizer to a fuel cell would have been obvious from the teachings of JP 9-35737 since it is apparently necessary to insure optimal operational efficiency. No details are shown in the aforementioned reference of the particulars of humidifiers 2A and 2B.

JP '468 teaches a steam source 24 connected to a mixing chamber 20 for mixing the injected steam with incoming process gas from compressor 23. The highly saturated process gas is subsequently cooled below its dew point by cooler 25 and a separator 28 discharges condensate. A heater 31 subsequently is used to heat the process stream to a desired temperature. One additional refinement of JP '468 is the use of a humidity controller 30

(controlled by a dew-point instrument 29) downstream of the saturating cooler 25. In view of the teaching of Weitman, which shows a saturator followed by a reheater and which lacks the refinement discussed above (i.e. the use of a humidity controller 30 controlled by a dew-point instrument 29), it would have been obvious to have omitted the dew point instrument 29 and controller 30 in JP '468 to attain a less expensive structure. In general the omission of an element and its associated function is not deemed to be patentable, see In re Karlson, 136 USPQ 184.

Alternatively, to have replaced saturator unit 1 of Weitman with units 20, 24 and 25, 27 and 28 of JP '468, which perform the same function, would have been obvious to reduce the overall size of the saturation section, and advantageously permit high temperature saturation to take place.

In view of JP '737 it would have been obvious to have duplicated the aforementioned JP '468/Weitman system for as many humidifier process streams as desired, which in the case of fuel cells, is two, one for the fuel gas and one for the oxidizer.

Claims 4 and 5 are rejected under 35 U.S.C. 130(a) as being unpatentable over the prior art as applied to claim 1 above, and further in view of Ebbing et al (5,544,275) or Othmer (3,617,699).

Heaters for long delivery pipes where significant temperature drops occur are well-known to prevent the condensation of gas components. To have used either of the heaters of Ebbing or Othmer in the outlet line of the prior art to keep the outlet line from experiencing condensation would have been obvious.



Claims 8, 9, and 17-21 are rejected under 35 U.S.C. 130(a) as being unpatentable over the prior art as applied to claim 7 above, and further in view of Oswalt et al (4,769,998).

Oswalt teaches a combined heater/chiller to achieve particularly high levels of regulation. To have substituted this type of chilled fluid source in place of the chilled fluid source shown in the prior art (i.e. element 27 in JP '468 or the unillustrated chilled fluid source connection to inlet 3 and 4 of Weitman) would have been obvious to one of ordinary skill.

Claims 11 and 12 are rejected under 35 U.S.C. ~~§ 103~~<sup>§ 103</sup>(a) as being unpatentable over the prior art as applied to claim 10 above, and further in view of Gunter USP 3,671,273.

Gunter teaches a shut-off valve (71), trap (74 or 68), pressure regulators 96 and non-return valve 64 as conventional components of a steam handling system. To have added such components to the steam source of the prior art to regulate it in conventional manner would have been obvious to permit the operator to controllably operate the steam source.

Regarding claim 12 to have duplicated the shut-off valve (71), pressure regulator (96) and non-return valve (64) for each of the humidifier for the fuel gas and oxidizer of the fuel cell would have been obvious from the teaching of JP 9-35737 which shows separate humidifiers for each of the fuel gas and oxidizer streams.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to John K. Ford at telephone number 571-272-4911.



**John K. Ford**  
**Primary Examiner**

Ford/am

March 23, 2005